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IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1 1. (currently amended) An optical switch, comprising:
2 at least one a first optical combiner for combining at least two optical pump
3 signals to produce a combined pump signal, and a second optical combiner for
4 combining an input data signal with the combined pump signal to produce a
5 combined signal;
6 a non-linear optical element for imparting a ~~second-order~~ third-order non-linear
7 effect on the combined signal; and
8 at least one optical splitter for separating the combined signal from said non-linear
9 optical element into respective generated optical bands;
10 wherein at least one of said at least two optical pump signals is controllably
11 modulated such that a logic sequence of said input data signal is controllably switched.

1 2. (original) The optical switch of claim 1, further comprising at least two optical
2 pump sources, each of said sources providing one of said at least two optical pump
3 signals, wherein at least one of said at least two optical pump sources is adapted to
4 controllably modulate its respective optical signal such that a logic sequence of said input
5 data signal is controllably switched and an output signal of said optical switch comprises
6 a multi-band switched optical signal.

1 3. (original) The optical switch of claim 1, wherein the frequency of said input data
2 signal is substantially equal to the average of the frequencies of said at least two optical
3 pump sources.

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- 1 4. (original) The optical switch of claim 2, further comprising a controller for
2 controlling the modulation of the at least one modulated optical pump source.
- 1 5. (original) The optical switch of claim 2, wherein one of said at least two optical
2 pumps is modulated and all other optical pumps are maintained constant.
- 1 6. (original) The optical switch of claim 5, wherein a resulting multi-band switched
2 output signal is substantially a Boolean AND combination of the logic sequence of said
3 input data signal and the logic sequence of said modulated optical pump signal.
- 1 7. (original) The optical switch of claim 5, further comprising a variable delay line
2 for synchronizing the input data signal and the modulated optical pump.
- 1 8. (original) The optical switch of claim 1, wherein said non-linear optical element
2 comprises a highly non-linear fiber.
- 1 9. (original) The optical switch of claim 1, wherein said non-linear optical element
2 generates a parametric amplification of the combined signals.
- 1 10. (currently amended) The optical switch of claim 9, wherein said ~~second-order~~
2 third-order non-linear effect comprises difference frequency generation.
- 1 11. (original) The optical switch of claim 9, wherein an output of said optical switch
2 comprises a replica of said input data signal and at least three idler signals.
- 1 12. (original) The optical switch of claim 11, wherein said at least three idler signals
2 comprise at least two mirrored idler signals and at least one translated idler signal.
- 1 13. (original) The optical switch of claim 12, wherein said mirrored idler signals
2 comprise input data signal conjugates.

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- 1 14. (currently amended) The optical switch of claim 9, wherein each of the
2 ~~wavelengths~~ wavelength of said input data signal are is converted into multi-band optical
3 signals a corresponding wavelength in said respective generated optical bands.
- 1 15. (original) The optical switch of claim 2, wherein said optical pump sources
2 comprise laser sources.
- 1 16. (currently amended) The optical switch of claim 1, wherein said at least one each
2 of said first and second optical combiner comprises a band splitter.
- 1 17. (original) The optical switch of claim 1, wherein said at least one optical splitter
2 comprises a band splitter.
- 1 18. (currently amended) A method of optical switching using a fiber parametric
2 device having at least two optical pump sources, comprising:
3 combining a signal from each of said at least two optical pump sources in a first
4 combiner to produce a combined pump signal, and combining the combined pump signal
5 with an input data signal to produce a combined signal;
6 imparting a ~~second-order~~ third-order non-linear effect on the combined signal;
7 and
8 controllably modulating at least one of said at least two optical pump sources such
9 that a logic sequence of said input data signal is controllably switched.
- 1 19. (original) The method of claim 18, further comprising separating said combined
2 signal into respective generated optical bands.
- 1 20. (currently amended) The method of claim 19, wherein said ~~second-order~~ third-
2 order non-linear effect generates a parametric amplification of said combined signal such
3 that an output of said fiber parametric device comprises a multi-band switched optical
4 signal.

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- 1 21. (original) The method of claim 20, wherein the output of said fiber parametric
- 2 device comprises at least a replica of said input data signal and three distinct idler bands.